Spence et al. entitled "60-fsec pulse generation from a self-mode-locked Ti:sapphire laser".

The Examiner has stated that claims 11, 14, 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As stated in response to an office action dated July 3, 2001, Loh et al. discloses an "Ultrahigh Frequency Optical Self-Modulator". The Loh system is a linear one wherein a misalignment of a mirror causes an increase in the frequency of modulation of polarization. The laser modes are not in phase and the modulation occurs every second round trip of the cavity. There must be a wave plate in the cavity, as shown in figure 2, element 30, in order to have polarization self-modulation. The waveforms produced from this system are nearly square or sinusoidal waveforms and the signal rarely goes to zero. The actual self-modulation that occurs is not directly caused by the misalignment of the mirror in the cavity. The only result from the misalignment is the increase (or decrease) in the polarization modulation frequency without affecting the laser mode of operation. Loh's system never goes into mode-locked operation.

Spence describes achieving self-mode locking using solid state lasers. The techniques used by Spence are specifically for solid state lasers and in the past, have proved ineffective for guided-wave structures. The technique described by Spence is Kerr-lens mode-locking. Kerr-lens mode-locking relies upon self-focusing, e.g. on a lensing effect produced by the laser pulse itself when it propagates through the gain medium. Kerr-lens mode-locking takes place only when the cavity geometry is set such that non-linear lensing improves round-trip laser gain or decreases round-trip losses. In guided-wave structures such as semiconductor laser diodes, self-focusing is not effective as a mode-locking mechanism since it represents only a weak effect in comparison with the guiding effect produced by the guided-wave structure itself. This is probably why passive self-modulation mode-locking based upon self-focusing is not operational in semiconductor laser diodes.

As the applicant stated in the background of the invention, "To date, only one method relying on nonlinear phase modulation has been successfully tested with

semiconductor laser diodes: coupled-cavity mode-locking." (page 6, lines 17 – 19). The results obtained by the Applicants are unexpected results.

Applicants respectfully submit that Loh et al. never achieve mode-locked operation (it is not suggested that such an operation is even desirable), therefore, it would not be obvious to combine Spence et al. with Loh et al. in order to obtain the desired result as claimed by the Applicants. Furthermore, there is no suggestion in Spence et al. that the suggested technique would work with guided-wave structures.

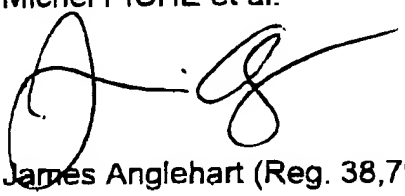
It is for these reasons that it is not obvious to combine the methods described in Spence with the system described by Loh. Applicants strongly believe independent claim 1 to be non-obvious with respect to the cited references.

Claims 2-17 are all dependent on independent claim 1. In view of the arguments stated above, Applicants consider these claims to be dependent on a valid claim and therefore patentable over the state of the art.

In view of the foregoing, reconsideration of the rejection of claims 1-17 is respectfully requested. It is believed that claims 1-17 are allowable over the prior art, and a Notice of Allowance is earnestly solicited.

Respectfully submitted,

Michel PICHÉ et al.

By: 

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09/504,896

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